

CLAIMS

1). (Previously presented) A method, comprising:

analyzing each routine, of a software program having a plurality of separately compilable routines, to create a plurality of local side-effect lattice problems for each routine, a side-effect of a routine being the reading from or writing to a storage by the routine;

merging the local side-effect lattice problems to create a global side-effect problem;

computing a global solution to the global lattice problem; and

splitting the global solution into local solutions for the local side effect lattice problems.

2). (Cancelled)

3). (Previously presented) The method of claim 1, further comprising:

determining, for each routine, whether a pointer parameter within the routine is used to write to or read from a storage device.

4). (Original) The method of claim 3, further comprising:

determining for each routine whether the pointer parameter is used to derive a return value of the routine.

5). (Previously presented) The method of claim 4, further comprising:

computing a lattice value associated with each of the pointer parameters, wherein the lattice value comprises one or more of a return, write, and read effect.

6). (Original) The method of claim 5, further comprising:

providing the lattice values to an interprocedural analysis solver to optimize compilation of the software program.

7). (Previously presented) The method of claim 6, further comprising:

representing the local side-effect lattice problems as directed graphs having edges and vertices, wherein

each edge has an associated monotone transfer function;

each vertex has a vertex value, wherein the vertex value is one of formal parameter, implicit parameter, local pointer variable, or gate parameter; and

a subset of the vertices is marked with the lattice values.

8). (Previously presented) A computer-readable medium having stored thereon a plurality of instructions, said plurality of instructions when executed by a computer, cause said computer to perform:

analyzing each routine, of a software program having a plurality of separately compilable routines, to create a plurality of local side-effect lattice problems for each routine, a side-effect of a routine being the reading from or writing to a storage by the routine;

merging the local side-effect lattice problems to create a global side-effect problem;

computing a global side-effect lattice solution to the global side-effect lattice problem; and

splitting the global side-effect lattice solution into local side-effect solutions for the local side-effect lattice problems.

9). (Cancelled)

10). (Previously presented) The computer-readable medium of claim 8 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform:

determining, for each routine, whether a pointer parameter within the routine is used to write to or read from a storage device.

11). (Original) The computer-readable medium of claim 10 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform:

determining for each routine whether the pointer parameter is used to derive a return value of the routine.

12). (Previously presented) The computer-readable medium of claim 11 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform,

computing a lattice value associated with each of the pointer parameters, wherein the lattice value comprises one or more of a return, write, and read effect.

13). (Original) The computer-readable medium of claim 12 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform:

providing the lattice values to an interprocedural analysis solver to optimize compilation of the software program.

14). (Previously presented) The computer-readable medium of claim 13 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform:

representing the local side-effect lattice problems as directed graphs having edges and vertices, wherein

each edge has an associated monotone transfer function;
each vertex has a vertex value, wherein the vertex value is one of formal parameter, implicit parameter, local pointer variable, or gate parameter; and a subset of the vertices is marked with the lattice values.

15). (Previously presented) A system, comprising:

a processor;
a memory connected to the processor storing instructions for interprocedural side-effect analysis executed by the processor, a side-effect of a routine being the reading from or writing to a storage by the routine;
a storage connected to the processor that stores a software program having a plurality of separately compilable routines;
wherein the processor analyzes each routine, of the software program, to create a plurality of local side-effect lattice problems for each routine;
wherein the processor merges the local side-effect lattice problems to create a global side-effect lattice problem; and
wherein the processor computes a global solution to the global lattice problem and splits the global solution into local solutions for the local side-effect lattice problems.

16). (Cancelled)

- 17). (Previously presented) The system of claim 15, wherein the processor determines for each routine, whether a pointer parameter within the routine is used to write to or read from the storage device.
- 18). (Original) The system of claim 17, wherein the processor determines for each routine whether the pointer parameter is used to derive a return value of the routine.
- 19). (Previously presented) The system of claim 18, wherein the processor:
computes a lattice value associated with each of the pointer parameters, wherein the lattice value comprises one or more of a return, write, and read effect.
- 20). (Original) The system of claim 19, wherein the processor:
provides the lattice values to an interprocedural analysis solver to optimize compilation of the software program.
- 21). (Previously presented) The system of claim 20, wherein the processor:
represents the local side-effect lattice problems as directed graphs having edges and vertices, wherein
each edge has an associated monotone transfer function;
each vertex has a vertex value, wherein the vertex value is one of a formal parameter, implicit parameter, local pointer variable, or gate parameter; and
a subset of the vertices is marked with the lattice values.